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LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

To the Editor of SCIENCE:

I was much pleased to see, by an abstract in "SCIENCE," that the opportunity which Philadelphia scientists had of examining into the anatomical peculiarities of the Orang-Outang was utilized, and that the body of the anthropoid, deceased in the Philadelphia Zoological Gardens, fell into the hands of as zealous an anatomist as Dr. Chapman. I have since had access to the original paper*, and would provisionally offer a few comments upon such statements as Dr. Chapman makes with reference to the cerebral relations of his anthropoid specimen.

It is stated that the brain of this Orang resembles that of a man more, as regards its general contour, than that of either of the Chimpanzees which the Dr. examined. It must be borne in mind that the internal dimensions of the cranial cavity of both anthropoid species show a relative excess of the transverse diameter as compared with the average mesocephalic human skull. But the correlated greater breadth of the brain is not due to a general greater breadth of all the lobes, for it is mainly provided for by the immense reduction in mass, and in every dimension of the frontal lobe. If the frontal lobe were relatively as well developed in the anthropoid apes as in man, the general contour of the cerebral hemispheres would be nearly the same in all three species, but more human in the Chimpanzee than in the Orang. Many of the inferences of the writer regarding contours and relations, seem to be based on the hardened and otherwise manipulated specimen, and for reasons which I shall advance are probably faulty. It is further stated, that the fissure of Sylvius runs up and down, "the posterior branch pursuing only a slightly backward direction." On looking at the accompanying plate (Pl. xvii, Fig. 1),† I perceive the reason for this statement. The Doctor's specimen had been allowed, evidently, to flatten out on its base, for the lower contour of the frontal and temporal lobes as well as of the cerebellum is an accurate straight line. Under such circumstances the fissures must change their natural direction. In both hemispheres of my Orang, the inclination of the Sylvian fissure (horizontal branch) is thirty degrees towards the ideal hemispherical axis. It is owing to the same imperfect manipulation that the author has arrived at the conclusion that the central fissure (Rolando's) is more forward in the Orang than in the other anthropoid. According to some recent writers‡ on the convolutions, the acuteness of the angle formed by the central fissure and the median fissure separating the hemispheres, forward is an index of cerebral development. It is acuter in both my Chimpanzee brains, then in the Orang in my possession or in any of those figured in plates.

I find the temporal lobe in my Orang well convoluted, showing the same sulci and in about the same degree of complexity as other anthropoid brains.

Dr. Chapman's figures give but a poor idea of the richness in gyri and the proportions of the different parts of the Orang's brain, at least as these are observable in the specimen which I demonstrated before the New York Academy of Sciences. In figure 2 § the frontal lobes are

too broad and too long, and the ethmoidal prolongation (*Sieb-bein-schnabel*) is not indicated anywhere. Some of the sulci drawn are not identifiable in any brain that I have seen a record of, and others which are recorded as constant can not be identified at all. It is not difficult to see from the drawings that the cerebral hemispheres were permitted to separate, the whole brain to flatten on its inferior surface, and that no successful attempt was made to retain the natural proportions of any of the parts.

I would add that my observation on the Island of Reil, in the Orang, is distinctly contradictory of that of Dr. Chapman, who states it to be unconvoluted. One of the hemispheres in my possession is so prepared as to show the sulci and *gyri breves* of the Orang's *insula*, which correspond as to their direction and relations to, though less numerous and well marked than, those of man. In every anthropoid dissected by myself I find these gyri and sulci, and one sulcus, is a constant feature of even the *Cynocephali*. Dr. Chapman has, on a former occasion, asserted the cerebellum to be uncovered by the cerebrum in one of his Chimpanzees. I examined carefully both specimens that were sent to Philadelphia, and of which the Doctor obtained the brains after death. They did not differ in their external cranial configuration from the other Chimpanzees; they were the healthiest, most active, and most intelligent of the species I have seen, and considering the fact that in both of my specimens the cerebrum clearly overlapped, I was much surprised to find that Dr. Chapman had discovered an exception in one of the two animals* I had myself seen. Subsequently Doctor Parker demonstrated that Doctor Chapman's observation was due to the imperfection of the methods followed. That the writer made erroneous inferences is clear from a statement in the very paper I am now commenting on. Dr. Chapman says, "It happens, however, that I have lying in alcohol for some years a number of human and animal brains. Among the latter, examples of the genera *Cebus*, *Ateles*, *Macacus*, *Cynocephalus*, *Cercopithecus*, etc., taken out of the skull sufficiently carefully, but preserved in the rudest manner without any regard to the above precautions. Now, while all of these brains have somewhat lost their natural contour, they are not so changed that in a single one, human or monkey, do I find the cerebellum uncovered by the cerebrum, and in every instance the posterior lobes overlap the cerebellum to a greater extent than I find is the case in my Orang. If the cerebrum and cerebellum in the Orang and Chimpanzee invariably bear the same proportion to each other as they do in man and the monkeys, why should not the brain of an Orang or Chimpanzee, after lying in alcohol for some years, exhibit the cerebellum covered by the cerebrum as in them? Why should it be necessary to replace the brain of the Chimpanzee or the Orang in the skull to make plaster casts, etc., if there is no difference between their brains and those of man and the monkeys, for there is no necessity of having recourse to such measures to prove that the cerebellum is covered in the latter?"

The above would be, to say the very least, a novel kind of argumentation, even if its assumptions were true. I have seen hundreds of brains taken out of the skull on *post mortems* of the human subject thrown on a slab, which would, if preserved (and in instances where they were preserved *did*), show an uncovered cerebellum. Why, Benedict of Vienna actually discovered that the cerebellum was uncovered in several criminals! This discovery was speedily exposed as a crude fallacy by Meynert and Heschl. It is remarkable that Dr. Chapman disposes with such facility, of the exact methods and relies so much on proofs which are, so to speak, the outgrowth of accident. Now, in every instance where the

* On the structure of the Orang-Outang by Henry C. Chapman, M. D. Proceedings of the Academy of Natural Sciences of Philadelphia, 1880, p. 160.

† See page 326 of this Journal, Fig. 2.

‡ Meynert Archiv für Psychiatrie VII. Clevenger. "The sulcus of Rolando an indication of intelligence" *Journal of Nervous and Mental Diseases*, 1880.

§ See page 326 of this Journal, Fig. 1.

* One of these was the black-faced variety which Du Chaillu attempted to make an extra species of (Not the *Tschego*.)

brain of the Gorilla, Chimpanzee and Orang has been carefully studied in place, and where measurements of the brain have been controlled by measurements of the cranial capacity and relations—in short, wherever the best and only reliable methods have been employed, the cerebellum has been found covered by the cerebrum. My own observations are the following: 1st. The dissection of an infant Chimpanzee (two years) and the study of the relations in the fresh state in presence of several professors of anatomy at the New York Medical Schools, as well as of neurologists. I need instance but two eye-witnesses, Professors Wm. H. Darling and Wm. A. Hammond. 2d. The dissection of a large Chimpanzee (probably nine years old) and the verifying of the complete concealment of the cerebellum in the fresh specimen, in presence of Professor Herman Dörner, Ph.D., and several of my class in comparative anatomy. The hardened brain shows the same relation as it did in the fresh state. 3d. The cast of the skull of a Chimpanzee which I purchased many years ago. 4th. The examination of another out of which the brain had been removed by a coroner (!) at Coney Island.

As regards my Orang Outang I would say that in the median line the cerebellum was markedly overlapped, but that towards the sides its margin coincided with that of the cerebral edge. This is due to the altogether different shape of the Orang's cerebellum as contrasted with that of the Chimpanzee. Its lateral lobes flare out and do not taper like the human and troglodyte cerebellum.

In conclusion, I would say that I have observed a fifth ventricle (*ventriculus septi pellucidi*) in the Orang and Chimpanzee. I should be much interested to know whether Dr. Chapman has examined into this point and whether he confirms my observation or not. Judging from the photograph of the medial surface of a Gorilla's hemisphere in Pausch's monograph, I believe this species to correspond to other anthropoid apes in this regard.

The olivary nucleus is far richer in crenulations and mass in the Orang than in the Chimpanzee.

E. C. SPITZKA, M.D.

130 East 50th Street, Dec. 22, 1880.

To the Editor of SCIENCE:

For some years past I have been a strong believer in the anatomical uses of the cat as a standard of comparison for other vertebrates. I am persuaded, as the result of experience and observation, that the cat is a valuable and convenient subject of preliminary dissection by the human anatomist. I have often desired a description of the muscles in a cheaper and more convenient form than the ponderous quarto of Straus-Durckheim.

The forthcoming "Laboratory Manual," by Professors Wilder and Gage, of Cornell University, will contain detailed descriptions of the muscles of the neck and the arm, with explicit directions for the exposure and the dissection of each in its natural order. A most desirable feature of the manual is the Synonymy and General Description of the muscles.

This manual has been prepared by practical instructors and is not a mere compilation. At the request of Dr. Wilder, I have recently made some dissections for the sake of verifying the accuracy of these descriptions, as given in the advanced sheets printed for the students in his laboratory, and I am informed that duplicate sets of these sheets may be obtained, at a nominal price, by others who will engage to return the extra copy with criticisms and suggestions which may aid the authors in making the work more accurate and complete.

T. B. STOWELL.

STATE NORMAL SCHOOL, CORTLAND, N. Y.,
December 22, 1880.

ASTRONOMY.

THE TEMPEL-SWIFT COMET.

Professor Frisby, of the Naval Observatory, has computed from the Washington observations of October 25, November 7, and November 20, an orbit of the comet discovered by Mr. Swift on October 10, without assuming a value of the eccentricity or of the period, and finds an elliptic orbit with a periodic time of a little less than six years. The observations used in this calculation are too near together to give a good determination of the periodic time, but the probability is that this comet has made two revolutions around the sun since its discovery by Mr. Tempel in 1869, and that its true period is nearly $5\frac{1}{2}$ years. The perihelion distance found by Professor Frisby is 1069; and the aphelion distance is 5472. Thus one of these distances corresponds very nearly to the earth's distance from the sun, and the other to that of Jupiter.

This comet was observed at Washington on December 22 and 24, and data are at hand, therefore, for a more exact determination of the orbit. Since December 24 the sky has been cloudy.

A. HALL.

WASHINGTON, December 29, 1880.

COMET DISCOVERED.

The Smithsonian Institution has received from the Astronomer Royal, of England, the announcement of the discovery by Cooper on December 21, at nine o'clock P. M., Greenwich mean time, of a bright comet in 1 hour 5 minutes right ascension and 6 degrees north declination, which, at seven o'clock, December 25, was in 1 hour 29 minutes right ascension and 2 degrees north declination.

WASHINGTON, Dec. 28, 1880.

ALVAN CLARK & SONS, of Cambridgeport, have now on hand, in all the various stages of completion, a most interesting collection of large refractors, to say nothing of a number of glasses of 8 inches or less diameter.

The lenses of the 23-inch equatorial for Prof. Young, at Princeton, are receiving the finishing touches, and have already shown a remarkable degree of perfection. The glass was cast by Feil. The mounting for this instrument is well advanced.

A 16-inch objective for Prof. Swift, of the Warner Observatory, is finished, and the mounting nearly so. This glass is of English manufacture.

The McCormick glass of 26 inches aperture, made at the same time as the Washington Refractor, and intended for the University of Virginia, is still in the shop and has been completed for several years, while the mounting requires but comparatively little additional work.

Two 8-inch refractors have been ordered and are partially finished,—one ordered by Prof. Young for the seminary at South Hadley, and the other by Dr. Engelmann, of Leipsic.

The flint glass disc for the 30-inch telescope, ordered by Struve for the Russian Government, has been received from Feil, and the crown glass is expected shortly. The mounting for this will probably be made abroad.

For the Lick Trustees a 36-inch refractor is ordered, but will not be completed for several years.

A 12-inch equatorial for observing the transit of Venus is nearly finished, and orders have been received for a 5-inch photoheliograph and a smaller comet-seeker.

In all or nearly all of these instruments the cell of the object glass is arranged so as to separate the lenses by several inches and allow a free circulation of air between them, as well as to afford an opportunity of readily reaching the inner surfaces of the glass. In the larger objectives especially, such a device is required in order to bring the temperature of the glass as nearly as possible equal to that of the external air.

W. C. W.